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Bell Atlantic

November 18, 1999

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

VIA HAND DELIVERY

Ms. Magalie Roman Salas
Secretary
Office of the Secretary
Federal Communications Commission
Room TW-B-204
445 Twelfth Street, S.W.
Washington, D.C. 20554

Re: Application by New York Telephone Company (d/b/a Bell Atlantic - New York), et al., for Authorization To Provide In-Region, InterLATA Services in New York, CC Docket No. 99-295 -- **ERRATA FILING**

Dear Ms. Salas:

On November 8, 1999, Bell Atlantic filed Reply Comments in support of the above-captioned Application. Attached to our Reply Comments as Appendix A, Tab 8, we submitted the Reply Declaration of Dr. Gregory M. Duncan.

The filed copy contained certain errors. In particular, there is a stray paragraph number on page 5, and certain Greek characters and formulas do not properly appear.

Enclosed for filing is a corrected original and seven copies of the Duncan Reply Declaration. Also enclosed is a diskette containing an electronic copy of the corrected Duncan Reply Declaration.

We will separately provide copies of this letter and the revised Duncan Reply Declaration to the Common Carrier Bureau, the Department of Justice, the New York Public Service Commission, and ITS.

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Thank you for your assistance in this matter. If you have any questions, please call me at 703-974-2819 or Steven McPherson at 703-974-2808.

Very truly yours,

Leslie A. Vial

Enc.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of

Application by New York Telephone Company (d/b/a Bell Atlantic-New York), Bell Atlantic Communications, Inc., NYNEX Long Distance Company, and Bell Atlantic Global Networks, Inc. for Authorization to Provide In-Region InterLATA Services in New York	)	CC Docket No. 99-295

DECLARATION OF DR. GREGORY M. DUNCAN ON BEHALF OF BELL ATLANTIC

November 8, 1999

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In the Matter of

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DECLARATION OF
DR. GREGORY M. DUNCAN
ON BEHALF OF BELL ATLANTIC

I, Gregory M. Duncan, hereby declare and state the following:

1. My name is Gregory M. Duncan and I am a Senior Vice President of National Economic Research Associates, Inc. ("NERA"). My business address is 444 Market Street, Suite 910, San Francisco, CA 94111. I received a Master's degree in Statistics in 1974 and a Ph.D. in Economics in 1976, both from the University of California, Berkeley. From 1975 to 1980, I taught in the Economics Department and Statistics Program at Northwestern University in Evanston, Illinois, where I was an Assistant Professor of Economics and of Statistics. In academic year 1980, I joined the faculty at Washington State University. There, I served as Professor of Economics and of Statistics. During that period, I was one of the first Associate Editors of the academic journal *Econometric Theory*. From 1987 to 1996 I was Staff Scientist at GTE Laboratories, Inc. attached to the Department of Economics and Statistics. The Staff Scientist position was reserved for a small number of independent researchers with responsibility for developing, proposing, and conducting research, as well as supervising the research of others;

in my case this included economists, mathematicians, and statisticians. As part of my responsibilities, I directed studies in telecommunications issues and often testified on the results before various state Public Utilities Commissions ("PUCs") and the Federal Communications Commission ("FCC"). During that period, I also had a joint appointment in the Economics Department at Boston University. I joined NERA in 1996 as a Vice President. I have continued my work in telecommunications, labor, and industrial organization and have testified on a variety of matters in many different venues. In addition to my current position, I have a position on the faculty in the Economics Department at the University of Southern California. My Curriculum Vitae, including a list of my testimony, is included as an attachment to this declaration.

2. Bell Atlantic-New York ("BA-NY") asked me, as an economist and statistician, to respond to the criticisms of commenting parties on its Performance Assurance Plan (the "PAP" or the "Plan"), which the New York State Public Service Commission ("NY PSC") adopted on November 3, 1999,[1] and to provide my opinion on the parameters of a properly designed service quality incentive plan for wholesale services. As detailed below, the levels of financial payment in the PAP are more than sufficient to induce BA-NY to provide appropriate and nondiscriminatory levels of service. Further, they more than cover the *incremental* profits BA-NY would retain if it prevented customers from shifting to Competitive Local Exchange Carriers ("CLECs"). In addition, the structure of the Plan itself is designed to address the areas of identified concern.

[1] *See* Cases 97-C-0271 and 99-C-0949, *Petition of New York Telephone Company for Approval of its Statement of Generally Available Terms and Conditions Pursuant to Section 252 of the Telecommunications Act of 1996 and Draft Filing of Petition for InterLATA Entry Pursuant to Section 271 of the Telecommunications Act of 1996 and Petition filed by Bell Atlantic - New York for Approval of a Performance Assurance Plan and Change Control Case 97-C-0271*, "Order Adopting the Amended Performance Assurance Plan and Amended Change Control Plan" (issued Nov. 3, 1999) ("NY PSC Order").

I. BACKGROUND AND INTRODUCTION

3. On October 19, 1999, the NY PSC filed its Evaluation of the application of Bell Atlantic[2] pursuant to § 271(c)(2)(B) of the Telecommunications Act of 1996, to provide in-region interLATA service with the FCC. In this Evaluation, the NY PSC found that "the facts demonstrate that Bell Atlantic-NY is meeting its legal obligation to provide" the items delineated in the 14-point Checklist in Section 271.[3] The NY PSC further stated that "an important tool for ensuring Bell Atlantic-NY's continued provision of the quality of service required by the NY PSC is the Performance Assurance Plan ... negotiated by the Department's Staff and BA-NY with public input."[4] In the Evaluation, the NY PSC presented its review of the benefits of the PAP in detail, finding among other things that "[t]he Plan's financial incentives [up to $270 million in annual price reductions for CLECs], ensure that Bell Atlantic-NY management will remain committed to Checklist Compliance even after § 271 approval is granted."[5] In addition, the NY PSC cautioned that "a simple totaling of performance measure passes or failures is not an accurate basis on which to determine Checklist compliance or non-compliance . . .."[6] Subsequently, the NY PSC formally adopted the PAP stating the same rationale as it presented in its Evaluation filed with the FCC:

> BA-NY has made substantial commitments in resources and is risking significant monies in potential bill credits to provide basic assurance that the local telecommunications market remains open after the company obtains long distance approval. These Plans [the PAP and the CCAP], as modified, are designed to appropriately redress discrimination, may be regularly modified to reallocate bill credits and may be amended to close potential loopholes.[7]

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[2] New York Telephone Company (d/b/a Bell Atlantic-New York), Bell Atlantic Communications, Inc., NYNEX Long Distance Company, and Bell Atlantic Global Networks, Inc. (collectively, "Bell Atlantic").
[3] Evaluation of the New York Public Service Commission, CC Docket No. 99-295, dated October 19, 1999, at 1 ("NY PSC Evaluation").
[4] *Id.* at 3.
[5] *Id.* at 3-4 (footnotes omitted).
[6] *Id.*. at 7.
[7] *See* NY PSC Order at 32. The NY PSC also adopted a Change Control Assurance Plan ("CCAP") that focuses exclusively on measurements and bill credits related to Change Control procedures for BA-NY's operational support systems.

4. BA-NY's potential competitors in the long distance marketplace, AT&T, MCI WorldCom, and Sprint, among others, have criticized almost every aspect of the PAP. The New York State Attorney General also has opposed some aspects of the Plan. The primary argument of these parties is that the amount at risk under the Plan is too low. They also have criticized the various mechanisms the Plan uses to determine whether the amounts at risk should be distributed to CLECs for unsatisfactory performance. As I describe below, the NY PSC correctly found that the amount at risk under the PAP is sufficient to ensure continuing compliance with the Checklist items. The Plan removes the potential rewards from engaging in discriminatory conduct. Moreover, the Plan's administrative mechanisms, which are used to calculate whether any bill credits are due CLECs, also are appropriate. The opponents, in proposing that larger amounts be put at risk, have demonstrated a fundamental misunderstanding of incentive plans and of the basic economic concepts of marginal costs and revenues that should drive their design.[8]

II. BA-NY'S PERFORMANCE ASSURANCE PLAN IS APPROPRIATELY STRUCTURED.

A. The Incentives In BA-NY's Plan Will Ensure Compliance.

5. The goal of any incentive plan or enforcement program is to ensure compliance. Therefore, it must contain incentives that induce BA-NY to provide service levels to CLECs which are comparable to those enjoyed by BA-NY's own customers. The structure of effective plans is well known and usually is not controversial.[9] An effective payment plan takes advantage of the fact that a firm will choose the level of service at which it is maximizing its profits. Such a level is called a firm's equilibrium. One of the regulator's goals is to design a payment plan so that the firm's choice of service quality and the regulator's desired level of service are both

[8] Annexed is Attachment A that provides my detailed analysis of the points I discuss below.
[9] The seminal article in this area was published in 1968. *See* Gary S. Becker, "Crime and Punishment: An Economic Approach," The *Journal of Political Economy,* Volume 76, Number 2, March/April 1968, p. 195.

attained at this equilibrium. A second and equally important goal is avoiding a payment plan that encourages "rent-seeking" behavior[10] on the part of fledgling entrants or expanding competitors. Such behavior seeks to supplement or even replace the income from operations with income from penalties or remedies provided under the incentive plan or enforcement program. As such, the incentives for CLECs to behave in an economically efficient manner will be distorted by greater than necessary payments.

6. Basic economics teaches us that a firm will undertake changes in its level of service until the marginal benefit of a change in the level of service just equals its marginal cost. A firm maximizes its profits by choosing a level of service (measured here by performance metrics) so that at equilibrium the marginal or incremental benefit of a small deviation ***from parity*** just equals the marginal cost or payment from the same small deviation. To structure an incentive payment plan properly, the regulator must design the payments to remove any incentive the Incumbent Local Exchange Carrier ("ILEC") would have to provide service below parity.

7. When faced with an appropriately designed payment plan, a firm examining its options will find that its profit maximizing choice is to provide parity service. Thus, the optimal payment plan should be designed to take away the additional profit of an incumbent that strays from parity. The incentive program also should have features so that as the disparity in service quality increases so too does the size of the penalty. However, at no time should a well-designed plan take away any more than the additional profit expected to be retained by the ILEC for a given disparity.

8. The most controversial part of designing an incentive plan is measuring or estimating the marginal benefits. The principles are clear however. If Δn customers were retained by BA-NY for a one-unit departure from parity and if $\Delta\pi$ is the expected Net Present Value ("NPV") of the additional profit from retaining these customers for the amount of time

[10] Rent seeking behavior is akin to looking for a free-ride.

they ordinarily remain customers, then the optimal penalty is $\Delta\pi$. The optimal incentive scheme takes away the expected incremental profits from a one-unit disparity from parity. Such a scheme takes away a larger and larger amount of profit as the size of the disparity increases (again, assuming that the amount of disparity is related to the amount of profit).

9. In no case should the expected amount of the payment deviate from the incremental gain. To do so creates a problem of rent-seeking. Specifically, if the payments from the plan are too high, some uneconomic entry or expansion on the part of competitors will occur. This expansion will not occur for the valid purpose of competing away potential profits, but for the perverse reason of capturing part of the excess payments.

10. This rent-seeking behavior on the part of the entrants will have the additional effect of causing an ILEC, in this case BA-NY, to over-invest in provisioning for competitors in order to avoid exposure to the penalties. This is characterized as "over" investment for two reasons. First, there will be too many competitors because of the opportunity to obtain excess rents in the form of credits, resulting in an uneconomic use of resources by the competitors. Second, there will be over investment because BA-NY would be required to guarantee a level of service far in excess of parity to avoid bill credits that are out of proportion to the profits that might be retained.

11. An incentive plan that sets penalties too high would result not only in wasted resources, but also could realistically result in BA-NY under-investing in other areas to compensate for the over-investment required to avoid making huge payments to CLECs. If the payment is set too high, BA-NY actually could find itself in the position of making payments to CLECs for simply taking service. Basically, any CLEC taking service will get a "monetary reward" if BA-NY has substandard performance in any Mode of Entry: "[s]ubstandard performance in any mode would result in 'market adjustments', i.e., bill credits, to competitors purchasing those types of service from BA-NY."[11] When regulation ceases to exist or regulators

[11] NY PSC Order at 3. It is made even clearer by the NY PSC that simply taking service will be rewarded when it

correct the situation, however, some inefficient entrants may be forced from the marketplace, which affects both shareholders and consumers. Moreover, the capital invested by BA-NY to serve these entrants will be sub-optimally utilized.

12. On the other hand, it simply is not true that monetary remedies or incentives below the theoretically optimal level "do not deter offensive behavior."[12] They do, even if to a somewhat lesser degree. However, it should be noted that there also are other factors at work here that supplement the financial incentives to provide parity service. Among other things, competition in New York is heavily facilities-based, and providing poor wholesale service to other carriers risks losing traffic entirely to other networks. And, if Bell Atlantic provided wholesale service so poor that it succeeded in driving competitors from the market, it would be subject to other enforcement mechanisms, including revocation of its long distance authority, and the NY PSC could always review the progress being made and take appropriate action if necessary.[13] For these reasons, it is paramount that the incentive plan be as accurate as possible when modeling the potential rewards to BA-NY from discrimination and establishing penalties that accurately reflect the size of those rewards.

B. The Monetary Amounts In BA-NY's PAP Are Appropriate.

13. Although the monetary amount at risk for BA-NY is roughly $269 million annually, critics of the PAP argue that the amount of bill credits potentially available to the CLECs is insufficient to deter discriminatory treatment. A few commenters, especially the major long distance carriers, claim the cap should be increased to anywhere from $400 million

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discusses the Critical Measures component: "[u]nlike the Mode of Entry component, however, the market adjustments will inure solely to the benefit of those competitors that received substandard performance in the subject month." *Id.* at 4.

[12] *See* Comments of MCI WorldCom, Inc. on the Application by Bell Atlantic-New York for Authorization to Provide In-Region, InterLATA Service in New York ("MCI Comments"), CC Docket No. 99-295, Appendix, Tab C, Joint Declaration of Dr. George S. Ford and Dr. John D. Jackson on Behalf of MCI WorldCom, dated October 19, 1999, at ¶ 17 ("Ford and Jackson").

[13] *See* NY PSC Evaluation at 4, n. 1: "Further, NYPSC has reserved all options under state law to remedy inadequate service . . .." *See also* NY PSC Order at 7: "[t]he amended PAP and CAP would allow the Commission to reallocate dollars at risk among any of the provisions in the PAP and CAP."

annually[14] to in excess of $1 billion.[15] As the NY PSC properly found, these amounts are excessive and not reflective of the marginal profits BA-NY could retain if it were to provide discriminatory services to the CLECs.[16]

14. In my opinion, the levels of financial payments proposed through the PAP are more than sufficient to induce BA-NY to provide the appropriate and nondiscriminatory level of services. AT&T's and MCI's proposed levels of financial incentives are excessive and neither economically optimal nor in the public interest. The optimal way to induce BA-NY to provide parity of service quality to its CLEC customers is to set the financial incentives such that BA-NY's profits will decrease if it offers services to CLECs at a level below parity. The expected financial incentive should offset any benefit BA-NY might gain from lowering service quality to CLECs.[17] As I discussed above, the amount of the gain to be taken away is the incremental profit from customers shifting away from the CLECs.

15. Moreover, "erring on the high side" is not the way to determine optimal fines. A plan that places too much at risk will have a negative impact on the market as well as on the development of competition. As I show in Attachment A to this declaration, the level of penalties in the plans in New York actually is somewhat high, but will certainly provide ample incentives to deliver excellent wholesale service. The additional amounts proposed by the opponents are simply not reasonable. The amount of money at stake is hundreds of millions of dollars, not just a few dollars. Ford and Jackson's suggestion (at ¶ 23) that the amount at stake

[14] *See* Comments of AT&T Corp. in Opposition to Bell Atlantic's Section 271 Application for New York ("AT&T Comments"), at ¶ 188 referencing Pfau and Kalb at ¶¶ 188-90 who, in turn, are referencing Hubbard and Lehr (*See* Affidavit of R. Glenn Hubbard and William H. Lehr on Behalf of AT&T Communications Of New York, Inc., Petition of New York Telephone Company for Approval of Its Statement of Generally Available Terms and Conditions Pursuant to Section 252 of the Telecommunications Act of 1996 and Draft Filing of Petition for InterLATA Entry Pursuant to Section 271 of the Telecommunications Act of 1996, Before the State of New York Public Services Commission, Case No. 97-C-0271, October 4, 1999.)

[15] Ford and Jackson at ¶ 24.

[16] *See* NY PSC Order at 17: "[t]he studies provided by commentors to support the claim that risk liability should be higher are flawed."

[17] In addition, the NY PSC reserves the option of reallocating the market adjustments for different metrics reviewed for compliance, thereby discouraging BA-NY from selecting certain metrics for discrimination. Noncompliance with the NY PSC's order may subject BA-NY to a fine of $100,000/day. (New York Public Service Law, Section 25.) Such fine would be in addition to the penalty liability under the PAP.

should be increased by an "inflation factor" of 1.5 to add a "little extra" as a safety net is truly absurd. Such a high "inflation factor" also would serve to encourage more rent-seeking behavior by CLECs by raising the stakes.

16. Further, linking monetary remedies to BA-NY's total annual revenues and cash flows, as some propose, is inappropriate. An optimal incentive program ties the monetary remedies to the incremental profits from the behavior in question. The optimal payment should equal, on the margin, the expected profit obtained from a small deviation from parity. What is necessary is that the expected size of the penalty increases with the magnitude of the disparity. This is accomplished when the monetary remedies increase with the size of the disparity and/or when the probability of detection increases with the severity[18] of the disparity. In the BA-NY Plan, it is the latter that has the dominant effect within a one-month period due to the fact that as the probability of detection increases, so too does the expected penalty.[19] Over longer periods of time, it is the former effect that dominates. For persistent violations, repeated monthly payments along with doubling provisions suggest that the maximum size of the payment becomes increasingly large to the point that this effect dominates any possible change in the probability of detection. For large disparities, the probability of detection is so close to one that there is little doubt that a true disparity exists.

C. None Of The Mechanisms Within BA-NY's PAP Allow It To Understate The Presence Of Discrimination.

17. A number of commenting parties claim that various mechanisms within the PAP will allow BA-NY to understate or mask the presence of discrimination. For example, some claim that aggregating metrics averages out or mitigates deficient performance.[20] Others appear to be concerned that the aggregation of CLEC data will allow BA-NY to systematically select a

[18] Severity means the average size of the disparity.
[19] The probability of detection in the BA-NY Plan is reflected in the statistical test that compares the LCUG Z to a predetermined critical value.
[20] *See for example* AT&T Comments at 87; *see also* Ford and Jackson at ¶ 30.

CLEC and discriminate against that CLEC,[21] while some claim that "[a]llowable misses let the RBOC discriminate without consequence . . .."[22] Finally, some parties challenge aspects of the statistical methodology used in the PAP. As I explain in detail in the accompanying Attachment, these parties' allegations are wrong. For example, the aggregation of similar metrics makes it easier to identify disparities in the underlying processes. This is a simple consequence of the law of large numbers, since the aggregation of individual scores into an overall weighted category provides a larger sample size and raises confidence levels. The NY PSC recognizes that "good performance on some measures does not offset poor performance on other measures."[23] Further, the aggregation of CLECs does not result in discrimination because the Critical Measures and Fund Reallocation Provision "provide sufficient protection against possible BA-NY attempts to engage in targeted discriminations" because "they apply to each CLEC."[24] Finally, allowable misses (Type I errors) simply will not allow BA-NY to discriminate without consequence because: 1) "the weighted density functions that characterize the random behavior of each individual metric relate to the distribution of the total performance score"; and 2) the NY PSC reserves "the right to revisit the MOE deadband calculation at the one-year re-opener."[25]

III. BA-NY'S PERFORMANCE ASSURANCE PLAN WILL FUNCTION AS DESIGNED.

18. As stated above, a properly designed incentive plan establishes monetary payments in such a manner that the ILEC's profit maximizing choice is to always provide service at parity. In the Technical Appendix attached to this document, I demonstrate empirically that the BA-NY Plan is solidly based on an appropriate application of deterrence theory. Specifically, my analysis has shown that the Plan is designed to take away all of the additional profit that accrues to an incumbent as a result of providing sub-par performance to

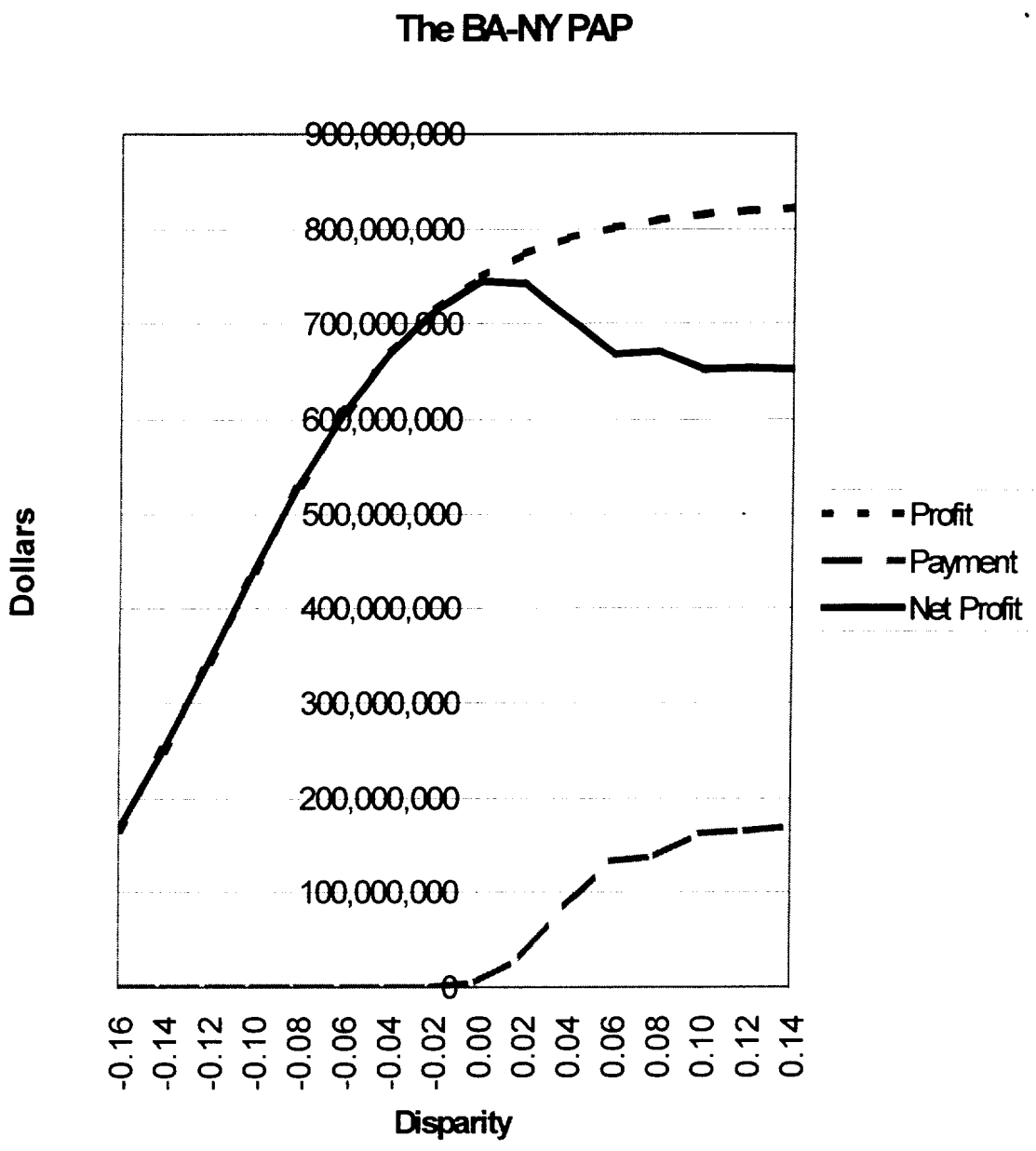
[21] *See for example* MCI Comments at 42.
[22] *See* Ford and Jackson at ¶ 32.
[23] NY PSC Order at 14.
[24] *Id.*
[25] *Id.* at 16.

CLECs. In other words, BA-NY's PAP takes away any incentive BA would have for deviating from parity.

19. I had hoped that the 0, -1, and –2 performance scoring structure and the re-scoring of –1 to 0 (if not repeated for two consecutive months) would mitigate the Type I error. Unfortunately, that is not entirely the case. Due to the random error in the model, BA-NY will still pay an average of $4.97 million per year even when service is provided at parity. However, the plan as structured is more than adequate to promote parity. I arrived at these conclusions by: 1) simulating the payment plan using CLEC and ILEC data; 2) simulating the market share BA-NY could expect to gain from disparities; and finally 3) calculating BA-NY's profit at parity along a range of disparities. In performing the analysis, I intentionally used somewhat extreme assumptions that would tend to increase the size of the appropriate penalty. For example, I assumed BA-NY could retain all of its customers if it deviated by only 15 percent from parity for all measures (which is extremely unlikely to be the case). Further, I assumed that BA-NY's profits per line, net of its common costs, are approximately 10 percent of revenues. The average monthly revenue per switched access line is approximately $30-$35.[26] I then tested to see if the marginal payment equaled the marginal profit at parity, which it did. Next, I tested to see whether the point of parity was a global optimum[27], which it was. My calculations appear in the Technical Appendix. The following chart demonstrates my findings.

[26] See Ford & Jackson, paragraph 22, Original source: 1998 *Statistics of Communications Carriers,* Tables 2.9 and 2.10. Revenues are from Account Numbers 5001, 5002, 5081, 5082, and 5084 (Table 2.9). I assumed an additional $5 per month, per line to account for long-distance access charge revenues. In addition, I assumed a monthly churn rate of 3 percent, a customer lifetime of 30 month, and an annual discount rate of 10.2%. At parity, BA-NY's estimated profit is equal to $778 million. Note that this reflects profit over a 30 month period.

[27] I tested to see that no other local optimum exists.



NOTE: BA-NY's estimated 30-month profit at parity is $778 million.

Most importantly, notice that the net profit line, which is the estimated BA profit minus penalty payments, achieves its maximum where the disparity is zero. Thus, for Bell Atlantic to maximize its profit, it must achieve parity. Consequently, I conclude that BA-NY's PAP, as constructed and as simulated, is effective in providing BANY no economic choice but to provide parity across the board.

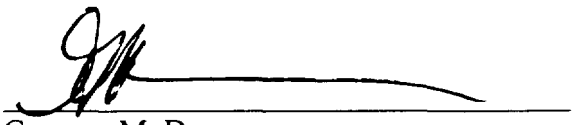
IV. CONCLUSION

20. The Performance Assurance Plan that the New York State Public Service Commission has adopted is effective, methodologically sound, and provides the correct level of financial incentive to induce BA-NY to provide CLECs with the appropriate level of service.

21. This concludes my Declaration.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct to the best of my knowledge and belief.

Executed on November 5, 1999



Gregory M. Duncan

ATTACHMENT A

I. INTRODUCTION

1. This attachment provides a detailed explanation of the principles that underpin a successful service quality incentive plan and explains why the Performance Assurance Plan ("PAP" or "Plan") is a properly designed incentive plan that follows those principles. This attachment also includes a rebuttal of MCI's and AT&T's arguments against the PAP. Finally, it concludes with a brief discussion on why the Commission should not consider the adoption of a federal incentive plan.

II. BA-NY'S PERFORMANCE ASSURANCE PLAN IS A PROPERLY DESIGNED INCENTIVE PLAN.

A. The Applicable Principles

2. Basic economic principles dictate that financial incentives must be based on BA-NY's marginal costs and revenues as opposed to its average or total costs and revenues.[1] The criterion for evaluating the effectiveness of a given scheme is simple—does the incremental expected profit from a one-unit deviation from parity equal the expected penalty from the same one-unit change. What is important are the marginal probabilities of detection and the marginal expected monetary rewards, both of which are reflected in the structure of the incentive system; i.e., how payments change as the ILEC moves farther away from parity. An efficient firm will choose the difference between its own service intervals or error rates and those of its rivals to equate the marginal profit of a disparity in service quality with the expected marginal cost, including the penalty, incurred as a result of such a disparity.

[1] Marginal revenues minus marginal costs equal marginal profits.

B. ILEC Behavior When Costs Are Set Too High.

3. If the expected cost is set too high, with either large financial incentive payments or a low critical value,[2] a firm may take inordinate measures to avoid any possibility of incurring the financial incentive payment. Such "gold-plating" or over-investment is economically inefficient, and therefore harmful to consumer welfare. For example, imagine that a regulator wants to make sure that restaurant-goers do not wait long for service and, to achieve this objective, decides to impose financial incentives on restaurants to encourage them to provide a specified level of service. If large enough incentive payments are levied, restaurants will take extreme steps to make sure the incentive payments are avoided, such as hiring one waiter per table, hiring extra chefs, or offering reduced menu choices. Eventually, this leads to higher costs, fewer options for consumers, and possible business failures without much added welfare for consumers or any benefit to competition. This problem is known as "over-deterrence."

4. If the penalties for non-compliance are inordinately high, there are predictable harmful unintended consequences in terms of BA-NY's behavior. These include:

Over-investment in Wholesale Service Quality. BA-NY will have an incentive to over-invest in wholesale services to avoid being misidentified as failing to comply. Indeed, since BA-NY will face some risk of being identified as being out of compliance even if it is in compliance, it has an incentive to invest so that the level of service quality received by CLECs exceeds parity levels. The more the incentive payment exceeds the optimal level, or the greater the probability of misidentification, the greater the over investment that will be undertaken by BA-NY.

Reduce Investment in Retail Service Quality. If BA-NY has an incentive to over-invest in wholesale services, this may lead to an inefficient allocation of resources as BA-NY could have invested in other areas, such as maintaining or enhancing services to retail customers.

[2] The critical value relates to a particular threshold of certainty that must be exceeded for the null hypothesis to be rejected. For example, if we require a 95 percent certainty to reject the null hypothesis, the relevant critical value is 1.645.

Delay Introduction of Technologies or Systems. BA-NY will be discouraged from introducing better technologies and systems. Unexpected glitches and problems are inevitable in the start-up phase of new technologies or systems. However, if these problems cause BA-NY to incur incentive payments for failing to meet service quality standards, the costs of start-ups will increase significantly.

Distort Technologies or Systems. BA-NY will have an incentive to restructure systems and technologies to place them outside of the guideline and incentives system, again distorting the telecommunications market.

Cause Market Exit. In the worst case, BA-NY's costs incurred from paying financial incentives may be so high that it resorts to bankruptcy, rather than continue under an overly burdensome incentive payment system. While this may seem far-fetched in BA-NY's case, the once invincible Pennsylvania Central Railroad suffered this same fate, because of poorly structured transportation incentives that prevented the railroad from operating as a profit maximizing firm.

C. CLEC Behavior When Payments Are Too High

5. Under the BA-NY PAP, bill credits for noncompliance are provided to CLECs. Rewarding CLECs when BA-NY is identified as non-compliant, however, encourages poor cooperation (the result of the problem of "moral hazard")[3] and even destructive activities on the part of CLECs. A moral hazard will become more pronounced when the penalties are set at arbitrarily high levels as some of the critics of the PAP have suggested. Some of the predictable consequences of rewarding CLECs when BA-NY is identified as non-compliant include:

Reward Poor Cooperation. CLECs will have less incentive to work with the ILEC to prevent operational problems, since the CLECs will receive offsetting compensation. The promise of

[3] A moral hazard occurs when a party (*e.g.*, a CLEC) tends to expend less than economically optimal effort to earn an economic gain because it realizes that any foregone gain will be compensated through another mechanism such as insurance or, in this case, a financial incentive payment from an ILEC. I also refer to this as "rent-seeking" behavior.